AMENDMENTS TO THE CLAIMS:

Please replace the prior listing of claims in the application with the following listing of claims:

1. (Currently amended): In a tire inflation system including an air supply source in fluid communication with a tire via a pneumatic conduit, a method of tire inflation, comprising the steps of:

providing a tire pressure retention valve in said pneumatic conduit adjacent to said tire;

determining an inflation pressure of the tire with a step-up procedure, whereby air bursts are communicated from said air supply source to a portion of the pneumatic conduit between the air supply source and said tire pressure retention valve~~, wherein the volume of at least one selected communicated air burst is related to a volume of a section of said conduit~~;

inflating said tire with an extended-pulse procedure, whereby extended bursts of air are communicated from said air supply source to the tire; and

performing a shut-down sequence once a predetermined target inflation pressure in said tire is reached.

2. (Currently amended): The method of tire inflation of claim ~~1~~21, wherein a determination of said volume of said at least one selected communicated air burst includes the steps of:

calculating a pressure level with reference to said volume of said section of said conduit;

taking a reading of a pressure in said section of said conduit;

comparing said pressure reading to said calculated pressure level; and

correlating an operation of a controllable valve to a result of said comparison.

3. (Original): The method of tire inflation of claim 1, further comprising the step of verifying the proper functioning of said tire pressure retention valve.

4. (Original): The method of tire inflation of claim 3, wherein the step of verifying the proper functioning of said tire pressure retention valve includes the steps of:

providing a first valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

providing a second valve in fluid communication with said pneumatic conduit between said first valve and said tire pressure retention valve;

sealing the portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

reading the pressure in said sealed portion of said pneumatic conduit a first time;

determining if said first pressure reading indicates increasing pressure in said sealed portion of said pneumatic conduit;

if said first reading indicates increasing pressure, opening said first valve, whereby a burst of air is communicated from said supply source to said tire pressure retention valve, thereby attempting to re-seat said tire pressure retention valve;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a second time;

determining if said second pressure reading indicates increasing pressure in said sealed portion of said pneumatic conduit; and

if said second reading indicates increasing pressure in said sealed portion of said pneumatic conduit, keeping said sealed portion of said pneumatic conduit sealed.

5. (Original): The method of tire inflation of claim 1, further comprising the step of diagnosing said system to determine if a leak in said tire pressure retention valve exceeds a vent capacity of said system.

6. (Original): The method of tire inflation of claim 5, wherein the step of diagnosing said system includes the steps of:

providing a first valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

venting the portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

reading the pressure in said portion of said pneumatic conduit between said first valve and said tire pressure retention valve a first time;

sealing said portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

reading the pressure in said pneumatic conduit between said first valve and said tire pressure retention valve a second time;

determining if said second reading is higher than said first reading; and

if said second reading is higher than said first reading, diagnosing said tire pressure retention valve.

7. (Original): The method of tire inflation of claim 1, further comprising the step of checking the integrity of a portion of said pneumatic conduit.

8. (Original): The method of tire inflation of claim 7, wherein the step of checking the integrity of a portion of said pneumatic conduit includes the steps of:

providing a first valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

providing a second valve in fluid communication with said pneumatic conduit between said first valve and said tire pressure retention valve;

sealing the portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

opening said first valve, whereby a burst of air is communicated to said sealed portion of the pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a first time;

waiting for a predetermined amount of time;

reading the pressure in said sealed portion of said pneumatic conduit a second time;

comparing said first and second readings; and

if said second reading is lower than said first reading, venting the portion of said pneumatic conduit between said first valve and said tire pressure retention valve to atmosphere.

9. (Original): The method of tire inflation of claim 8, wherein a volume of said burst of air that is communicated to said sealed portion of said pneumatic conduit when said first valve is opened is related to a target inflation pressure of said tire.

10. (Original): The method of tire inflation of claim 1, wherein the method further comprises the step of verifying the proper functioning of a pressure indicator, including the steps of:

providing a controllable valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

providing a pressure indicator in fluid communication with said pneumatic conduit between said controllable valve and said tire pressure retention valve;

venting to atmosphere the portion of said pneumatic conduit between said controllable valve and said tire pressure retention valve;

reading the pressure in said vented portion of the pneumatic conduit with said pressure indicator a first time;

determining if said first pressure reading is above atmospheric pressure by at least a predetermined amount;

if said first pressure reading is above atmospheric pressure by at least a predetermined amount, cycling said controllable valve;

reading the pressure in said vented portion of the pneumatic conduit with said pressure indicator a second time; and

if said second pressure reading is above atmospheric pressure by at least a predetermined amount, activating a warning light system.

11. (Original): The method of tire inflation of claim 1, further comprising the steps of:

diagnosing selected system components; and

activating a warning light system if said diagnosis indicates a problem.

12. (Original): The method of tire inflation of claim 1, wherein the step of determining the inflation pressure of said tire with a step-up procedure includes the steps of:

providing a first valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

providing a second valve in fluid communication with said pneumatic conduit between said first valve and said tire pressure retention valve;

sealing the portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

opening said first valve for a first period of time, whereby a first burst of air is communicated to said sealed portion of said pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a first time;

determining if said first pressure reading is at a target inflation pressure;

if said first pressure reading is at said target inflation pressure, shutting said tire inflation system down;

if said first pressure reading is below said target inflation pressure:

opening said first valve for a second period of time, whereby a second burst of air is communicated to said sealed portion of said pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a second time;

determining if said second pressure reading is below said target inflation pressure; and

if said second pressure reading is below said target inflation pressure, repeating said steps of opening said first valve for a second period of time, closing said first valve, reading the pressure in said sealed portion of said pneumatic conduit a second time, and determining if said second pressure reading is below said target inflation pressure.

13. (Original): The method of tire inflation of claim 12, further comprising the steps of:

counting the number of air bursts communicated to said sealed portion of said pneumatic conduit; and

if said target inflation pressure is not reached within a predetermined number of bursts, opening said first valve for a third period of time.

14. (Original): The method of tire inflation of claim 12, wherein a determination of a volume of at least one of said first and said second bursts of air includes the steps of:

calculating a pressure level with reference to a volume of said sealed portion of said pneumatic conduit;

comparing at least one of said pressure readings to said calculated pressure level; and

correlating an operation of at least one of said valves to the result of said comparison.

15. (Original): The method of tire inflation of claim 1, wherein the step of determining the inflation pressure of said tire with a step-up procedure includes an oversize line check sequence, comprising the steps of:

providing a first valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

providing a second valve in fluid communication with said pneumatic conduit between said first valve and said tire pressure retention valve;

sealing the portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

opening said first valve for a first period of time, whereby a first burst of air is communicated to said sealed portion of said pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a first time;

determining if said first pressure reading is more than a predetermined amount below a target inflation pressure;

if said first pressure reading is more than a predetermined amount below said target inflation pressure, opening said first valve for a second period of time, whereby a second burst of air is communicated to said sealed portion of said pneumatic conduit.

16. (Currently Amended): The method of tire inflation of claim 15, wherein said predetermined amount relates to ~~said~~ a volume of ~~said~~ a selected section of said conduit.

17. (Original): The method of tire inflation of claim 1, wherein the step of inflating the tire with an extended-pulse procedure includes the steps of:

providing a first valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

providing a second valve in fluid communication with said pneumatic conduit between said first valve and said tire pressure retention valve;

sealing the portion of said pneumatic conduit between said first valve and said tire pressure retention valve;

opening said first valve for a first period of time, whereby a first burst of air is communicated to said sealed portion of said pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a first time;

if said first pressure reading is less than a target inflation pressure:

opening said first valve for a second period of time, whereby a second burst of air is communicated to said sealed portion of said pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a second time;

determining if said second pressure reading is below said target inflation pressure;

if said second pressure reading is below said target inflation pressure, repeating said steps of opening said first valve for a second period of time, closing said first valve, reading the pressure in said sealed portion of said pneumatic conduit a second time, and determining if said second pressure reading is below said target inflation pressure; and

terminating said inflation procedure when the pressure in said sealed portion of said pneumatic conduit is at said target inflation pressure.

18. (Original): The method of tire inflation of claim 17, further comprising the steps of:

monitoring the time spent repeating said steps of opening said first valve for a second period of time, closing said first valve, reading the pressure in said sealed portion of said pneumatic conduit a second time, and determining if said second pressure reading is below said target inflation pressure; and

if said monitored time exceeds a predetermined amount of time, diagnosing said tire inflation system.

19. (Original): The method of tire inflation of claim 17, further comprising the steps of:

determining if said first pressure reading is more than a predetermined amount below said target inflation pressure;

if said first pressure reading is more than a predetermined amount below said target inflation pressure:

opening said first valve for a third period of time, whereby a third burst of air is communicated to said sealed portion of said pneumatic conduit;

closing said first valve;

reading the pressure in said sealed portion of said pneumatic conduit a third time;

determining if said third pressure reading is more than a predetermined amount below said target inflation pressure; and

if said third pressure reading is more than said predetermined amount below said target inflation pressure, diagnosing said tire inflation system.

20. (Original): The method of inflating a tire of claim 1, wherein the step of performing a shut-down sequence once said predetermined target inflation pressure in said tire is reached includes the steps of:

providing a controllable valve in fluid communication with said pneumatic conduit between said air supply source and said tire pressure retention valve;

venting the portion of said pneumatic conduit between said controllable valve and said tire pressure retention valve;

verifying the proper functioning of said tire pressure retention valve; and

if pressure verification indicates said pressure retention valve is not properly functioning, sealing the portion of said pneumatic conduit between said controllable valve and said tire pressure retention valve.

21. (New): The method of tire inflation of claim 1, wherein the volume of at least one selected communicated air burst is related to a volume of a section of said conduit.

22. (New): A tire inflation system, comprising:

an air supply source in selective fluid communication with a tire;

a pneumatic conduit extending between said air supply source and said tire to provide said fluid communication;

a first valve in fluid communication with said pneumatic conduit, said first valve including an open position and a closed position, whereby air passes from said air supply source through a first portion of said pneumatic conduit to the first valve, and when said first valve is in the open position, air passes through the first valve to a second portion of said pneumatic conduit;

a second valve disposed between said second portion of said pneumatic conduit and a third portion of the pneumatic conduit, said second valve being in fluid communication with said pneumatic conduit, the second valve including an open position, a closed position, a first channel, and a second channel, whereby when said first channel aligns with the second and third portions of the pneumatic conduit when the second valve is in said open position, air passes between said second and third portions of said pneumatic conduit via said second valve, and

when said second channel aligns with the third portion of the pneumatic conduit when said second valve is in said closed position, air vents from said third portion of said pneumatic conduit to atmosphere via the second valve;

a rotary union in fluid communication with said third portion of said pneumatic conduit adjacent said tire;

a first pressure indicator in fluid communication with said first portion of said pneumatic conduit to indicate an air pressure in the first portion of the pneumatic conduit; and

a second pressure indicator in fluid communication with said third portion of said pneumatic conduit to indicate an air pressure in the third portion of the pneumatic conduit.

23. (New): The tire inflation system of claim 22, further comprising a control unit operatively connected to said first and second valves and said first and second pressure indicators, wherein said control unit accepts direct input of a target air pressure setting for said tire.

24. (New): The tire inflation system of claim 23, further comprising a warning light system operatively connected to said control unit.

25. (New): The tire inflation system of claim 24, wherein said warning light system includes a first light selectively flashing an error code corresponding to a system problem.

26. (New): The tire inflation system of claim 25, wherein said warning light system further comprises a second light indicating selected system problems by illuminating.

27. (New): The tire inflation system of claim 22, further comprising a vent tube in fluid communication with said second channel of said second valve, said vent tube including a porting structure.

28. (New): A tire inflation system for supplying air to a tire mounted on a wheel, said wheel in turn being rotatably mounted on an axle having a bore, said tire inflation system comprising:

an air supply source;

a first pneumatic conduit having a first end in fluid communication with said supply source, wherein said first conduit extends from the supply source to said axle bore and along the axle bore to an outboard end of said axle;

a rotary union in fluid communication with a second end of said first pneumatic conduit, wherein said rotary union is secured in said outboard end of said axle bore, and wherein the rotary union includes a hardened one-piece air tube, said air tube including at least one bend and being rotatably mounted in a body of said rotary union; and

a second pneumatic conduit having a first end in fluid communication with said rotary union and a second end in fluid communication with said tire.

29. (New): The tire inflation system of claim 28, wherein said body of said rotary union includes two mating halves removably secured together.

30. (New): The tire inflation system of claim 28, wherein said rotary union includes an end plug press-fit in said axle bore, said end plug receiving said body of the rotary union, and wherein tightening of the body of the rotary union to the end plug secures said press fit.

31. (New): The tire inflation system of claim 28, wherein said air tube is hardened by melanite nitriding.

32. (New): The tire inflation system of claim 28, wherein said rotary union includes a hose fitting having a plurality of rounded distal barbs, and a single proximal barb with a sharp edge.

33. (New): The tire inflation system of claim 28, wherein said second pneumatic conduit includes a hose connection including:

a tee fitting with a male member;

a bulk head fitting with a counterbore receiving said male member, said counterbore having a base; and

a sealing ring at said base of said counterbore contacting a portion of said male member, whereby air leakage through said hose connection is reduced.

34. (New): The tire inflation system of claim 28, wherein said second pneumatic conduit includes a hose connection including:

an air tube having a shoulder fitting;

a tee fitting forming an air channel; and

a counterbore formed in said tee fitting about a portion of said air channel, said counterbore receiving said shoulder fitting of said air tube, and said counterbore including a depth less than the length of said shoulder fitting, whereby the shoulder fitting bottoms out in said counterbore, thereby reducing rotation of said shoulder fitting.